OCEAN GALES AND STORMS, JANUARY 1936—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began January—	Time of lowest barometer January—	Gale ended January—	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN—Continued			° ′	° ′				*Inches*					
Rakuyo Maru, Jap. S. S.	Yokohama	Honolulu	33 00 N.	179 30 E.	4	2a, 5	4	29.37	SW	SW, 5	SW	SW, 8	SW-WSW.
Golden Tide, Am. S. S.	Dairen	San Francisco	46 23 N.	162 45 W.	4	4a, 5	5	28.95	SE	SSE, 8	WSW	SW, 9	SSE-SSW.
Saparoea, Du. M. S.	Manila	Portland, Oreg.	46 00 N.	179 24 E.	5	3a, 6	6	28.52	E	ENE, 8	N	E, 9	None.
Golden Dragon, Am. S. S.	San Francisco	Yokohama	48 06 N.	164 24 W.	8	4a, 9	9	28.75	WSW	W, 8	NW	WNW, 9	WSW-WNW.
General Lee, Am. S. S.	Yokohama	San Francisco	41 36 N.	134 00 W.	11	2p, 11	12	29.52	SSW	SSW, 9	SW	SSW, 10	None.
Golden Tide, Am. S. S.	Dairen	do	39 31 N.	126 25 W.	12	Noon, 12	12	29.83	SSW	S, 9	SSW	S, 10	None.
Grays Harbor, Am. S. S.	Taku Bar	Vancouver, B. C.	43 00 N.	155 40 E.	13	8p, 13	14	28.74	ESE	WNW, 9	WSW	W, 11	ESE-WNW-W.
Michigan, Am. S. S.	Manila	San Francisco	37 00 N.	149 00 E.	13	1p, 14	16	29.62	WNW	W, 10	NW	W, 10	None.
Columbia Maru, Jap. M. S.	San Francisco	Seikoshin	42 30 N.	145 12 E.	13	10p, 13	18	29.13	WSW	W, 8	NNW	W, 12	
Ogura Maru, Jap. M. S.	Ventura	Yokohama	31 29 N.	177 47 E.	15	Noon, 15	15	29.47	SSE	W, 8	WNW	SSE, 10	SSE-W.
President Grant, Am. S. S.	Yokohama	Victoria, B. C.	48 12 N.	173 36 E.	16	Noon, 16	17	29.36	S	S, 8		S, 9	
Golden Star, Am. S. S.	Manila	San Francisco	35 23 N.	143 45 E.	16	2p, 17	17	29.49	W	W, 8	WSW	W, 9	None.
City of Vancouver, Br. S. S.	Tsingtao	Los Angeles	43 08 N.	140 33 W.	16	8a, 17	17	29.62	S	S, 7	SW	S, 8	S-SSW.
Nichiyo Maru, Jap. M. S.	Yokohama	do	45 59 N.	176 55 E.	17	Mdt, 17	17	29.00	ENE	E, 8	E	E, 9	None.
Grays Harbor, Am. S. S.	Taku Bar	Vancouver, B. C.	48 40 N.	173 45 E.	17	4a, 18	18	29.14	E	ENE, 8	NE	NE, 9	None.
Michigan, Am. S. S.	Manila	San Francisco	40 00 N.	169 30 E.	19	Mdt, 18	19	29.03	WNW	WNW, 6	W	NW, 9	WSW-WNW.
President Grant, Am. S. S.	Yokohama	Victoria, B. C.	50 00 N.	163 36 W.	19	1a, 18	20	28.92	S	ESE, 6	S	S, 9	None.
Texan, Am. S. S.	Balboa	Los Angeles	15 33 N.	95 10 W.	22	7p, 22	22	29.72	NW	NNE, 11	E	NNE, 11	N-E.
Grays Harbor, Am. S. S.	Taku Bar	Vancouver, B. C.	50 05 N.	150 40 W.	24	Noon, 24	24	28.78	E	S, 9	S	S, 9	SE-S.
President Cleveland, Am. S. S.	Yokohama	Honolulu	34 25 N.	152 46 E.	24	do	25	29.81	NW	WNW, 8	WNW	WNW, 8	NW-WNW.
Michigan, Am. S. S.	Manila	San Francisco	44 — N.	149 — W.	24	4a, 25	25	29.18	W	SSE, 7	SSE	SSE, 9	SSE-S.
Anna Maersk, Dan. M. S.	Yokohama	Los Angeles	42 00 N.	163 30 W.	24	10a, 25	26	28.97	S	W, 10	SSE	W, 10	
President Jefferson, Am. S. S.	do	Victoria, B. C.	44 48 N.	161 30 E.	26	11p, 28	28	28.79	WNW	W, 6	WNW	W, 11	None.
Heian Maru, Jap. M. S.	do	Vancouver, B. C.	47 42 N.	173 06 E.	28	5p, 28	28	28.68	E	E, 8	SE	E, 8	E-S.

NORTH PACIFIC OCEAN, JANUARY 1936

By WILLIS E. HURD

Atmospheric pressure.—As during the preceding December atmospheric pressure remained abnormally low over much, if not most, of the North Pacific Ocean. So far as can be judged from the data in table 1, negative departures were prevalent except within the region lying east of China and south of the principal Japanese Islands, where small plus departures are indicated for the area covered by the oceanic projection of the Asiatic anticyclone. The center of the Aleutian cyclone this month is best indicated by the low average pressure, 29.34 inches, occurring at Dutch Harbor. The departure from normal pressure at this station was —0.24 inch.

Anticyclonic activity was for the most part sporadic, and average pressures of 30 inches or higher occurred only off the coasts of China and California.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, January 1936, at selected stations*

Station	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow	30.09	+0.01	30.70	31	29.48	21
Dutch Harbor	29.34	—.24	30.06	31	28.34	20
St. Paul	29.49	—.14	30.12	15	28.26	21
Kodiak	29.45	—.14	30.44	31	28.80	20
Juneau	29.85	—.03	30.46	30	29.08	7
Tatoosh Island	29.89	—.09	30.44	28	29.00	4
San Francisco	30.09	—.02	30.35	1	29.68	31
Mazatlan	29.90	—.05	30.02	15	29.84	5, 6, 17, 31
Honolulu	29.95	—.05	30.08	10	29.56	31
Midway Island	29.92	—.11	30.20	9	29.58	14
Guam	29.88	—.02	29.94	23, 31	29.76	1
Manila	29.88	—.01	29.96	29, 30	29.72	1
Hong Kong	30.06		30.25	17, 18	29.95	1
Naha	30.12	+.04	30.30	20	29.88	1
Chichishima	30.03	+.02	30.20	23	29.68	2
Nemuro	29.66		30.28	24	28.74	31

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—The weather continued stormy during January over much of the North Pacific Ocean north of the thirtieth parallel. The greater part of this enormous area was mostly dominated by fluctuating cyclonic storms of the Aleutian type, many of which carried their influence southward well into middle latitudes. An unusual number of cyclones of Asiatic origin crossed northern Japan and entered the ocean this month. This is well indicated by the low average pressure, 29.66, recorded for Nemuro, near the northeastern extremity of Hokushu Island.

Although gales of record occurred over some part of the ocean on at least 26 days of the month, there were certain definite regions where frequency or energy of storminess was most pronounced. One region lay east of Japan, another within 6° or 8° north and east of Midway Island, and a third to the westward of the Washington and Oregon coasts.

Within the first region, lying roughly between 30° and 45° N., to the westward of 160° E., gales were reported on 10 days, the stormiest of which were the 12th to 17th. On the 13th and 14th a deep and intense cyclone lay over this section. The American steamer *Grays Harbor*, near 43° N., 156° E., reported a barometer of 28.74, accompanied by a west wind of force 11, on the 13th. On the following day, near the south coast of Hokushu, the Japanese motorship *Columbia Maru* reported a west wind of hurricane force, accompanied by rising pressure. During the 27th and 28th strong cyclonic conditions prevailed in the neighborhood, with the American steamer *President Jefferson*, near 45° N., 162° E., reporting the highest wind, W. 11, and the lowest pressure, 28.79 inches.

In the Midway Island area—30° to 36° N., 178° E. to 170° W.—pressures fell nearly to 29 inches, which was unusually low for the latitude, near the first and middle of the month; and gales of force 10 to 11 were experienced by ships on the 1st and 15th. On the 25th, near 34° N.,

178° W., winds as high as force 11 were again encountered. The neighborhood was stormy on several other dates, but no winds exceeding force 9 were reported.

Exceptionally heavy weather occurred off the Oregon and Washington coasts, and thence for several hundred miles seaward, during several days of January from the 1st to the 12th. On the 1st, south to southwest gales of force 9–10 were reported by the steamships *Mexican* and *Stanley Hiller* close in along the coast between 43° and 45° N. The maximum wind velocity at the North Head Weather Bureau Station on that date was 56 miles from the south. On the 3d and 4th the highest velocities reported at North Head were 57 and 56 miles, respectively, and during these days a long stretch of coast line was battered by high winds and seas which caused heavy damage to communication systems and other property. At sea, strong gales to hurricane velocities were experienced within the locality 43°–46° N., 130°–145° W., on the 3d, while on the 4th scattered westerly gales within much the same area were encountered of force up to 10.

Low pressure persisted over the northeastern part of the ocean between the 4th and 11th, but the weather meanwhile appears to have been only moderately stormy, with no gales at sea reported in excess of force 8, and those far from the coast. On the 12th, however, storminess increased locally along the Oregon coast and in the neighboring portions of the sea. The wind became violent during the night of the 11–12th near the mouth of the Columbia River, and the American steamer *Iowa*, caught in the early morning in a heavy gale, was wrecked on Peacock Spit, the so-called graveyard of ships, about 3 miles southwest of North Head Station, where she was lost with her entire crew of 34 men. This is reported as having been the first major marine disaster at that point since 1913. At North Head the maximum wind velocity registered that day was 73 miles from the south. At sea southerly gales of force 10 were reported on the 12th by the American steamers *General Lee* and *Golden Tide*, the first at 7 a. m., in 41°36′ N., 134° W., the second at 11 a. m., in 39°31′ N., 126°25′ W.

Along the middle stretches of the northern steamship routes gales were moderately frequent during the month, but so far as reported, despite the prevailing low pressures accompanying them, did not exceed 9 in force.

Tropical cyclones.—The subjoined report by the Reverend Bernard F. Doucette, S. J., of the Manila Observatory, indicates that two tropical disturbances, one of minor nature, occurred in the Far East during January 1936.

Tehuantepecers.—Ships traversing the Gulf of Tehuantepec reported northers of force 7 on the 7th and 20th, and of force 11, on the 22d.

Fog.—Fog was reported on 4 days off the Washington and Oregon coasts; on 10 days off the California coast, and on 2 days off the coast of Lower California. Farther at sea the occurrence of fog was rare and scattered.

TYPHOON AND DEPRESSION OVER THE FAR EAST, JANUARY 1936

By BERNARD F. DOUCETTE, S. J.

[Weather Bureau, Manila, P. I.]

Two disturbances, one a typhoon, the other a depression, appeared during the first few days of the month. The depression affected the weather of the Philippines; the typhoon, however, remained at a distance in the Pacific Ocean.

Typhoon, December 31, 1935, to January 3, 1936.—A typhoon formed over the Eastern Caroline Islands, intensifying on the last day of the year near latitude 8.20° N., longitude 150° E. It moved WNW. about 1,150 miles and filled up January 3, 1936, in the regions around latitude 14° N., longitude 136° E.

Depression, December 29, 1935, to January 3, 1936.—Forming about 120 miles S. of Yap, this mild depression moved WNW. toward the Philippines. It passed over Surigao Strait, then across Leyte, Cebu, and Panay Islands on its way to Mindoro Island, where it recurved to the NE. It passed over the Camarines Provinces on its way to the Pacific Ocean, where it filled up, about 120 miles away from the coast. This depression was of little importance with respect to resulting damage, though considerable rain fell over the Visayan Islands and shipping was delayed slightly.

CLIMATOLOGICAL TABLES

DESCRIPTION OF TABLES AND CHARTS

(R. J. Martin)

Table 1 gives the data ordinarily needed for climatological studies for about 180 Weather Bureau stations making simultaneous observations at 8 a. m. and 8 p. m. daily, seventy-fifth meridian time, and for about 20 others making only one observation. The altitudes of the instruments above ground are also given.

Beginning with January 1, 1932, all wind movements and velocities published herein are corrected to true values by applying to the anemometer readings corrections determined by actual tests in wind tunnels and elsewhere.

Table 2 gives, for about 37 stations of the Canadian Meteorological Service, the means of pressure and temperature, total precipitation, depth of snowfall, and the respective departures from normal values except in the case of snowfall. The sea-level pressures have been computed according to the method described by Prof. F. H. Bigelow in the REVIEW of January 1902, **30:** 13–16.

Table 3 lists the severe local storms reported in the United States during the month. It is compiled from reports furnished mostly by officials of the Weather Bureau.

CHART I.—*Temperature departures.*—This chart presents the departures of the monthly mean surface temperatures from the monthly normals. The shaded portions of the chart indicate areas of positive departures and unshaded portions indicate areas of negative departures. Generalized lines connect places having approximately equal departures of like sign. This chart of monthly surface temperature departures in the United States was first published in the MONTHLY WEATHER REVIEW for July 1909, but smaller charts appear in W. B. Bulletin U for 1873 to June 1909, inclusive.

CHART II.—*Tracks of centers of* ANTICYCLONES; and

CHART III.—*Tracks of centers of* CYCLONES. The roman numerals show the chronological order of the centers. The figures within the circles show the days of the month, the location indicated being that at 8 a. m., seventy-fifth meridian time. Within each circle is also an entry of the last three figures of the highest barometric reading (chart II), or (chart III) the lowest reading reported at or near the center at that time, in both cases as reduced to sea level and standard gravity. The intermediate 8 p. m. locations are indicated by dots. The inset map on chart II shows the departure of monthly mean pressure from normal and the inset on chart III